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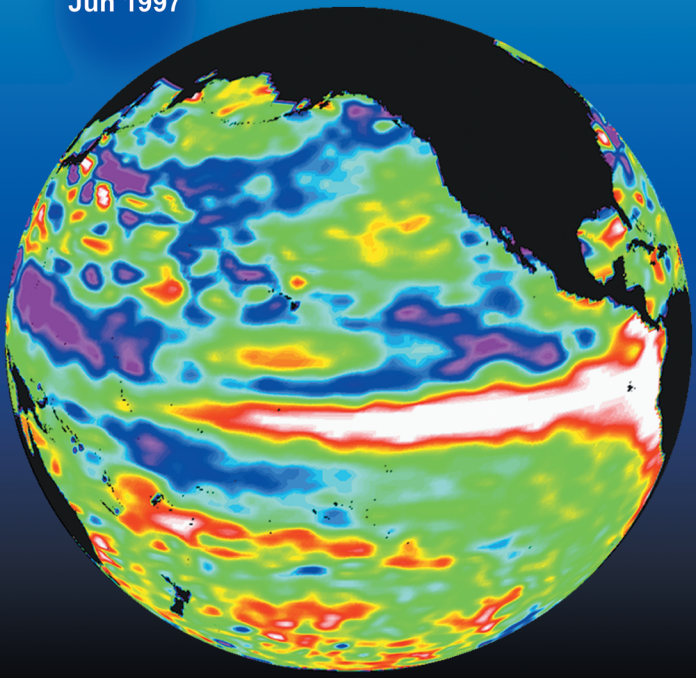
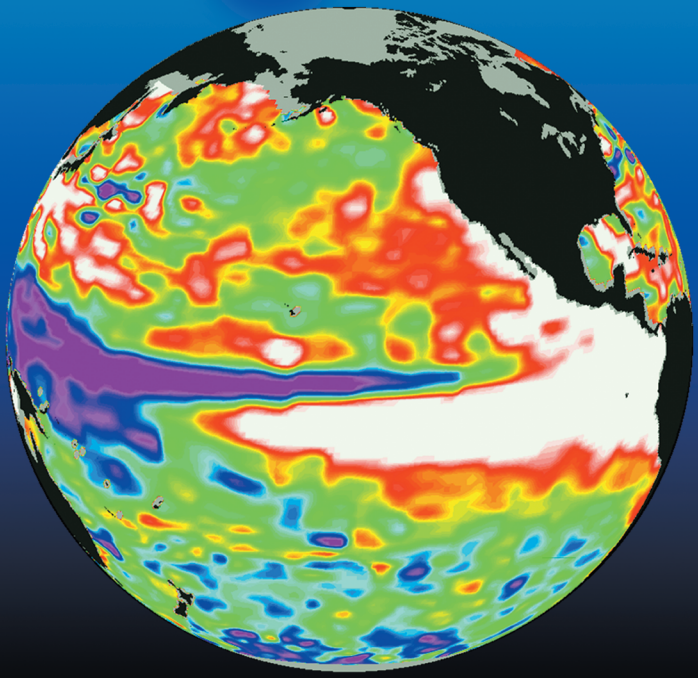


The Dynamic Pacific: El Niño to La Niña

National Aeronautics and
Space Administration

Nov 1997



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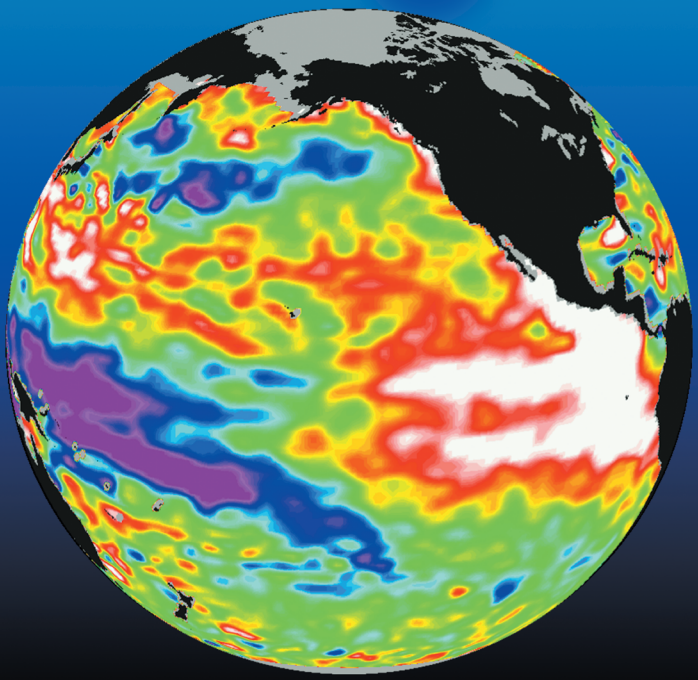

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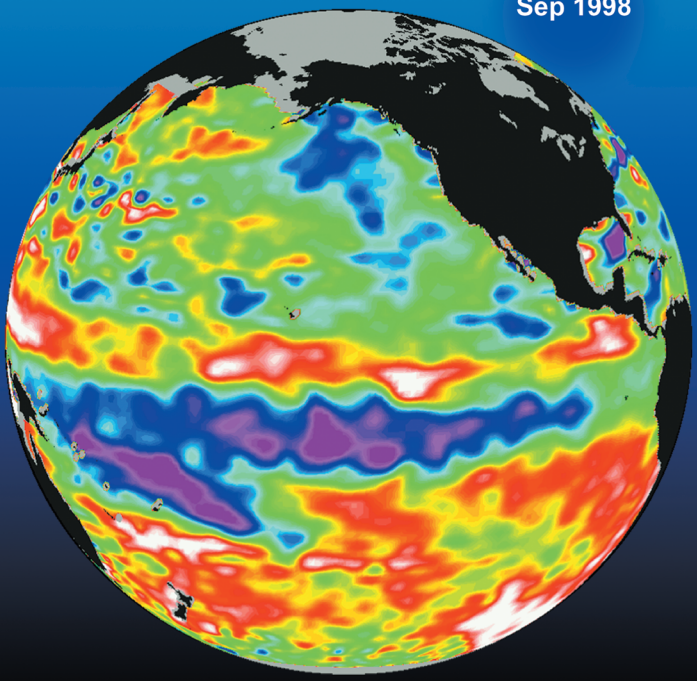

The Dynamic Pacific: El Niño to La Niña

Measuring Ocean Surface Topography from Space

The largest and deepest of Earth's five ocean basins, the Pacific Ocean is so big that all the world's continents could fit into it. Because of its enormous size, the Pacific has a major effect on the world's climate.

These images of the Pacific were created with altimetry data from the ocean-observing satellite TOPEX/Poseidon. Satellites help us study the complex relationship between the ocean and atmosphere and how they work together to influence climate. One example of this relationship is the El Niño Southern Oscillation, also known as El Niño and La Niña.

El Niño, first named by Peruvian fishermen, refers to the warm current that invades the waters off the western coast of South America around Christmas. Scientists now use the term for the warm current and atmospheric conditions that occur in the equatorial Pacific every three to seven years. El Niño can disrupt fisheries and cause severe weather and flooding. La Niña is the opposite of El Niño. During a La Niña, cold, nutrient-rich water occupies much of the tropical Pacific. La Niña can also create extreme weather conditions such as drought in the Southwestern United States.

The images show the changes in sea surface height between an El Niño and a La Niña during the period from June 1997 to September 1998. Colors represent relative sea surface heights. Red and white show the higher sea surfaces created by the warm El Niño. Purple and blue indicate the lower sea surface heights and colder ocean temperatures of La Niña.

TOPEX/Poseidon, which mapped global sea surface heights every ten days from 1992 to 2005, was joined by the Jason-1 satellite in 2001. The Ocean Surface Topography Mission on the Jason-2 satellite (OSTM/Jason-2) followed in 2008.

For 16 years and counting, these satellites have been measuring ocean surface topography and recording the changes in global sea level. The long-term, precise monitoring of sea surface height from space has been critical in improving our understanding of the ocean's role in climate, and has provided new insights into how changes in the global climate affect the ocean.

NASA, in cooperation with the French Space Agency (CNES), operated TOPEX/Poseidon and Jason-1. OSTM/Jason-2 is a joint partnership between NASA, CNES, NOAA, and the European Organization for the Exploitation of Meteorological Satellites (Eumetsat).

National Aeronautics and Space Administration

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http://sealevel.jpl.nasa.gov
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